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ABSTRACT

The deferred maintenance problem on college and university campuses is addressed. Deferred maintenance refers to larger or more expansive maintenance work that can be delayed and is not performed when needed or reported, usually because its cost is beyond the annual maintenance and operating budget of the physical plant department. Eventually there is need for an analysis of the consequences of further delays, such as the increased cost of delaying a repair or a major interruption of vital services. To identify problem areas, information must be collected, including the following: whether maintenance procedures are managed efficiently; whether there is a clear policy on differentiating physical plant from departmental expenses; whether new buildings have been constructed without sufficient additional funds to maintain them properly; and whether buildings are being used most effectively. After identifying the problem, a detailed building maintenance survey of each building or site condition is required. Steps in a building maintenance survey are as follows: determining the purpose of the survey and developing detailed instructions to accomplish objectives; listing buildings and an order of priority; scheduling the dates and times to start and complete the survey of each building; deciding on the inspection format (in general by the features of building or in detail by categories for each component); recording details of problem areas or specific conditions; determining the most cost-effective solution; making estimates for each solution; preparing the request; and developing a rating system for deferred maintenance. Using in-house staff versus outside consultants for the survey is also addressed. (SW)

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Coping with Deferred Maintenance

by L. TERRY SUBER

Colleges and universities have three basic resources:

- People (faculty, students, and staff)
- Physical plant (land, buildings, and fixed equipment)
- Funds (state appropriations, endowments, gifts, tuition, grants, and contracts)

For most institutions physical resources represent the largest single asset. Nevertheless, the priority given to academic programs and salaries has made it difficult to increase funding for proper maintenance.

Failure to acknowledge the existence of deferred maintenance or the need for major repairs may conceal the actual financial distress of an institution.

Many administrators are aware of the problem but not of its extent. For example, at Colorado State University there are approximately 4 million gross square feet of academic administrative space in structures built from 1890 to 1980. The cost of bringing all major buildings up to maintainable condition is between $15 million and $30 million, or from $4-$8 per square foot at the 1980 construction index cost. Approximately half of this amount could be classified as deferred maintenance, and the other half as major repairs due now or within the next five years.

Though many administrators may try to wish the problem away, it will, in fact, worsen before it gets better. An effective deferred maintenance program will last five years or more, perhaps indefinitely at some institutions. In 1970, Colorado State's painting cycle was six to seven years. Today it is ten to twelve years and it will take six to eight years to restore a maintainable cycle.

Coping with deferred maintenance during the 1980s will be complicated and will challenge business officers and physical plant directors. Programs to pay for deferred maintenance will be essential. The cost of energy will continue to rise, faster than the rate of inflation. There will be few new buildings constructed, and existing buildings will age. At the same time, faculty, students, and administrators will expect more from the plant operation. Reducing deferred maintenance will require a larger portion of the financial appropriation to correct existing problems and prevent new ones.

Background

The deferred maintenance problem on college and university campuses is not new. During World War II, maintenance of the plant was reduced to a bare minimum. In the late 1950s, predictions of a "tidal wave" of new students resulted in a strong preference for increased square footage and new buildings. Studies indicate that 70 to 75 percent of all existing physical facilities were constructed in the past 25 to 30 years. Thus, in the 1980s "new buildings" are in fact now "old buildings," because major maintenance in the 1970s was deferred.

Now that academic programs and construction of new facilities are being cut back and enrollment is declining, maintenance is the new goal: maintenance of enrollments, maintenance of faculty, maintenance of programs, and maintenance of physical facilities. Preventive maintenance is not enough, as institutions change to meet the needs of our society and as facilities age and are used more heavily.

What Is Deferred Maintenance?

The word "maintenance" in the article refers to keeping the plant in good condition so that it performs the intended function without undue interruption. Preventive maintenance, routine maintenance, and emergency maintenance are terms used to describe work performed to prevent serious damage or, ultimately, a breakdown. Major repairs that cannot be delayed are called emergencies.

Deferred maintenance is the term commonly applied to larger or more expensive maintenance work that can be delayed and is not performed when needed or reported, usually because its cost is beyond the annual maintenance and operating budget of the physical plant department. As these major unfunded repairs accumulate, they begin to endanger the integrity of structural and mechanical systems and to permit penetration by the weather. Eventually there is need for an analysis of the consequences of further delays, such as the increased cost of delaying an inevitable repair or a major interruption of vital services.

The deferred maintenance problem is intertwined with projects to eliminate health and safety hazards or building code violations, to provide accessibility for the handicapped, to retrofit facilities for improved energy conservation, and to renovate

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facilities that have become functionally obsolete but are structurally sound. Ideally, all of these problems should be addressed in a rational and comprehensive manner and on a building-by-building basis, when appropriate, to insure maximum economy of total expenditure. For example, roofing insulation should be upgraded when a roof is replaced as a deferred maintenance project, and access for the handicapped should be improved when fire code problems are corrected. Cost effectiveness can be enhanced only by a comprehensive facilities renewal program. Flexibility is imperative; financial procedures that are set in concrete will prevent any institution from examining itself realistically.

Identifying the Problem

The first step is to collect data.

1. Has a list of major repairs been submitted annually requesting funds not covered in the annual operating budget? Was the institution aware of a backlog of major repairs?
2. Are maintenance procedures being managed efficiently? Is there an effective preventive maintenance program in full operation?
3. Is there a clear policy on differentiating physical plant from departmental expenses? Does the institution follow the NACUBO/APPA classification of accounts?
4. Is there a maintenance plan that encompasses projected uses or intended conversions of buildings?
5. Are new programs dispersed evenly within available facilities? Have spaces been modernized or alterations and modifications made for new programs in lieu of major repairs?
6. Have there been shortcuts or less expensive construction in the capital building program that have ultimately caused maintenance or operating costs to rise?
7. Have new buildings been constructed without sufficient additional funds to maintain them properly?
8. Are certain buildings with a high maintenance cost and low space use being maintained?
9. Are buildings used most effectively? Is expensive space allocated for storage? Is one person using an office designed for two?
10. Is there a procedure to make decisions on the basis of cost benefits or cost effectiveness in terms of energy conservation, health and safety codes, remodeling, or even deferred maintenance?
11. Are there special persons who command higher standards of maintenance for their special interest areas?

Inadequate maintenance has led to the deferral of more and more major repairs, to greatly increased emergency maintenance, and to reduction of funds available for preventive or routine maintenance. The lower the level of maintenance, the shorter will be the useful life of a building and its equipment, and the higher will be the cost of deferred maintenance.

The maintenance deficit, or backlog of deferred maintenance, must be eliminated, and at the same time annual maintenance budgets must be increased and management of facilities improved. Deferred maintenance will continue to be a problem until physical facilities are brought up to maintainable condition.

The first question to ask is whether physical resources are managed in the most effective manner, especially in terms of space use, maintenance, personnel, energy, and code compliance. To answer this, a facilities audit, which is a detailed analysis of all facilities in terms of space use, functional suitability, cost of operation, physical condition, and level of maintenance, may be needed. Such an audit will uncover major physical plant problems caused by aging and deferred maintenance. Based on this evaluation, buildings may be designated for (1) retention in current condition, (2) renovation or improvement, or (3) complete removal through demolition, sale, or lease. The audit can result in reduction of the overall operating and maintenance cost burden and can lead to improvement of remaining facilities.

Can the Problem Be Solved?

As soon as enough facts and information have been collected to determine that a deferred maintenance problem exists and to establish goals or objectives, a detailed building maintenance survey of each building or site condition is required.

The NACUBO/Association of Governing Boards Deferred Maintenance Survey sought to learn if there were deferred plant projects that staff felt were important to the well-being of the facilities. Only one in five of the responding institutions had a formal deferred maintenance inventory. Nearly every physical plant director, however, had a list of desired projects that had been delayed pending arrangements for funding.

One advantage of such a survey is that managers gain an idea of the magnitude of physical plant needs not covered by the annual operating budget. Managers can annually review each project in the survey, assess how long it can be delayed, and estimate costs at current prices. Management then has the option of funding the most pressing projects or continuing deferred maintenance.

The facilities audit enables managers to examine the use of facilities, the condition of buildings and their support systems, preventive maintenance efforts, and related factors.

Once the audit has been completed, plans and budgets for accomplishing the deferred maintenance program over several years can be formulated. It is important for administrators to demonstrate that investment in deferred maintenance is more effective than spot renovation or new construction.

Who Performs the Deferred Maintenance Survey?

The physical plant staff is probably the greatest source of information on buildings and site needs and should be involved in developing a deferred maintenance program. Even if a consulting firm is hired, it must have the guidance and cooperation of key physical plant personnel during the building audit.

A survey of the needs of buildings can be performed in a variety of ways. The size and organization of the campus and the technical capabilities of the physical plant staff must be considered.

Using campus physical plant personnel to perform a survey requires freeing them from other responsibilities. Consistency is difficult to achieve unless the same team performs all the work on a given survey.

An advantage of using in-house personnel is that they can learn from the process. This type of survey helps key people to be aware of conditions that are not yet emergencies, to view the condition of buildings from a different perspective, and to develop procedures for reporting conditions in a timely manner.

On the other hand, an outside consultant makes it possible to perform the survey quickly and with persons who will not be interrupted by physical plant duties.

If an outside consultant is hired, it is vital that campus personnel design

the survey in advance so that it indicates exactly what is to be checked, how observations are to be recorded, how data are to be processed, and how results are to be reported. It is also important to determine in advance the facilities to be surveyed. Will the entire physical plant be covered, or only those facilities used for teaching and research or those built before a specific date? Will the approach be piecemeal or comprehensive?

Undertaking the Building Maintenance Survey

Necessary for successful management of a building maintenance program are knowledge of the current physical condition of existing buildings, enough detailed information to determine corrective action, development of cost data, and establishment of priority ratings. The steps in the process of developing a survey to supply the above are basically the same for all institutions but will vary according to the degree of detail required:

1. *Types and objectives.* What is the purpose of the survey, how is it to be used, and what will be the results? Will it be a short or a full audit? Will it provide sufficient information to make plans, estimates, and priority ratings?

2. *Instructions and scope.* Is the total building and its electro-mechanical systems to be surveyed, or only portions thereof? Are furnishings (blinds, drapes, chairs, lab benches) to be included? Are access for the handicapped and fire and safety conditions part of the survey? (Detailed instructions are essential to accomplish the objectives.)

3. *Buildings.* A listing of buildings and an order of priority are required.

4. *Schedule.* Since certain building components require different skills for surveying different functions, scheduling the dates and times to start and complete each building is essential. It is likely that certain building systems will have to be shut down so that observations can be made.

5. *Inspection format.* This is the heart of the total program. It can be organized in a general way by the features of buildings or in detail by categories for each component, with descriptions of what to look for. Colorado State chose a detailed format, as one of the objectives was to develop a permanent building-condition file. Such a file facilitates an ongoing, controlled major maintenance program and limits the possibility of another accumulation of deferred maintenance.

6. *Inspection.* The inspection form will record details of problem areas or specific conditions. This requires a team of specialists in the respective building trades to make necessary observations and evaluate specific conditions.

7. *Determining solutions.* To determine the most cost-effective solutions for deteriorating conditions and to restore facilities to the original condition will require the combined professional talents of architects and engineers.

8. *Estimating.* An estimate will probably be required for each solution. It should be as detailed and specific as possible so that it can be more easily updated if schedules for funding are delayed or if conditions change.

9. *Preparing the request.* This is a summary sheet for each project for which funds are being requested. A brief but precise statement of the problem, its cause, and probable consequence is needed. The recommended solution, estimated cost, and benefits must be stated. A good color photograph of deteriorating conditions will be helpful.

10. *Priority of projects.* Each institution will probably develop its own rating system for deferred maintenance projects. The rationale behind each system will be to protect, in the following order, occupants, buildings, built-in equipment, and other facilities. Each of the above can be divided into several categories. To promote objectivity, some institutions develop mathematical weightings and assign each project a weighted factor.

Project Analysis

An effective building survey will determine the physical condition of each building and produce an estimate of the cost of both deferred maintenance and of major repairs that have not been deferred and are required to restore the building to maintainable condition. If the cost seems high, a facilities renewal audit should be undertaken. Cost estimates here can be rough and on a line-item basis. The following questions should be answered:

- Is the building suitable for its function and current use, or will it require remodeling?
- Is it accessible to the handicapped?
- Does it comply with present occupancy, fire, health, and safety codes?
- What is the total cost compared to the cost of a new building or to relocation of the program to another building?

Selling the Deferred Maintenance Program

Identifying the problem is half the solution. If business managers are unable to sell the urgency of the deferred maintenance problem, the results will be what economists call "disinvestment"—plant decay or total shutdown. Because the stakes are so high, solutions must be found without delay. ♦

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